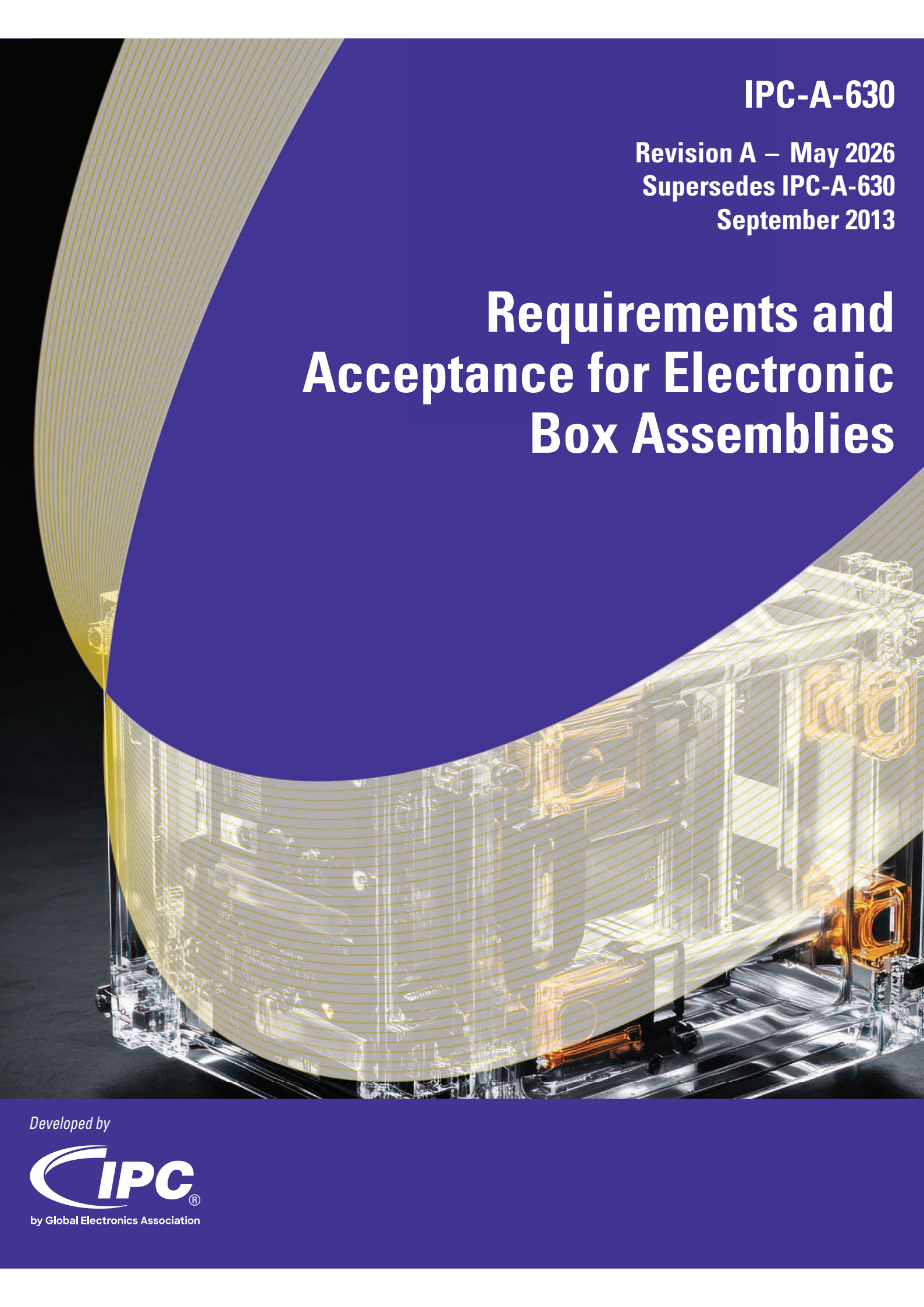


The background of the cover features a large, stylized, semi-transparent yellow 'C' shape on a dark blue background. Inside the 'C' shape, there is a detailed, high-resolution image of a complex electronic assembly, possibly a multi-layer printed circuit board or a microelectronic package, showing various components, solder joints, and intricate wiring. The assembly is depicted in a perspective view, giving it a three-dimensional appearance.

IPC-A-630

Revision A – May 2026

Supersedes IPC-A-630

September 2013

Requirements and Acceptance for Electronic Box Assemblies

Developed by



by Global Electronics Association

GEA Mission

The Global Electronics Association promotes industry growth and strengthens supply chain resilience.

**About IPC
Standards by
Global Electronics
Association**

IPC standards and publications by Global Electronics Association are designed to serve the public interest through eliminating misunderstandings between manufacturers and purchasers, facilitating interchangeability and improvement of products, and assisting the purchaser in selecting and obtaining with minimum delay the proper product for their particular need. Existence of such standards and publications shall not in any respect preclude any entity from manufacturing or selling products not conforming to such standards and publications, nor shall the existence of such standards and publications preclude their voluntary use.

IPC standards and publications by Global Electronics Association are approved by committees without regard to whether the standards or publications may involve patents on articles, materials or processes. By such action, Global Electronics Association does not assume any liability to any patent owner, nor does Global Electronics Association assume any obligation whatsoever to parties adopting a standard or publication. Users are wholly responsible for protecting themselves against all claims of liabilities for patent infringement.

**Global Electronics
Association
Position Statement
on Specification
Revision Change**

The use and implementation of IPC standards and publications by Global Electronics Association are voluntary and part of a relationship entered into by customer and supplier. When a standard or publication is revised or amended, the use of the latest revision or amendment as part of an existing relationship is not automatic unless required by the contract. Global Electronics Association recommends the use of the latest revision or amendment.

**Standards
Improvement
Recommendations**

Global Electronics Association welcomes comments for improvements to any standard in its library. All comments will be provided to the appropriate committee.

If a change to technical content is requested, data to support the request is recommended. Technical comments to include new technologies or make changes to published requirements should be accompanied by technical data to support the request. This information will be used by the committee to resolve the comment.

To submit your comments, visit the Status of Standardization page at www.electronics.org/status.



IPC-A-630A

Requirements and Acceptance for Electronic Box Assemblies

If a conflict occurs
between the English
language and translated
versions of this document,
the English version will
take precedence.

Developed by the 7-31J Electronic Box Assemblies Task Group of the 7-30
Product Assurance Committee of IPC

Global Electronics Association Standards and Artificial Intelligence (AI) Statement

Global Electronics Association is the trading name of IPC International, Inc.,
which owns the copyright to all IPC Standards and other IPC materials.

The Global Electronics Association explicitly prohibits:

- The integration or transfer of any data whether in the form of IPC books, standards, metadata, or other formats — into AI engines or algorithms by any person or entity, including authorized distributors and their end users.
- Activities involving data harvesting, text and data mining, enrichment, or the creation of derivative works based on this data, including the use of automated data collection methods or artificial intelligence.

Any breach of these provisions is considered a copyright infringement unless expressly authorized in advance in writing by the Global Electronics Association.

Supersedes:
IPC-A-630 – September 2013

Users of this publication are encouraged to participate in the development of future revisions.

Contact:

Global Electronics Association
3000 Lakeside Drive, Suite 105N
Bannockburn, Illinois
60015-1249
Tel 847 615.7100
Fax 847 615.7105

This Page Intentionally Left Blank

Acknowledgment

Any document involving a complex technology draws material from a vast number of sources across many continents. While the principal members of the 7-31J Electronic Box Assemblies Task Group of the 7-30 Product Assurance Committee are shown below, it is not possible to include all of those who assisted in the evolution of this standard. To each of them, the members of Global Electronics Association extend their gratitude.

7-30 Product Assurance Committee

Chair

Robert Cooke
NASA Johnson Space Flight
Center

Vice Chair

Debbie McDade
Advanced Rework
Technology

7-31J Electronic Box Assemblies Task Group

Cochairs

Richard Rumas
Honeywell Aerospace
Eddie Hofer
Collins Aerospace

630 A-Team

Global Electronics Association recognizes these A-Teams for their exceptional leadership and effort in the development of this standard. A-Teams are dedicated groups of volunteers who undertake a significant amount of work in standards development on behalf of their group.

A special thank you to the 630 A-Team for their dedication and commitment to this effort. Their support and time during the development of this document is greatly appreciated. A list of members at the time this document was published are listed below.

David Fellows

BAE Systems

Eddie Hofer*

Collins Aerospace

Scott Meyer

Collins Aerospace

Symon Franklin

Custom Interconnect Ltd

Christina Rutherford

Honeywell Aerospace

Richard Rumas*

Honeywell Aerospace

Jeffrey P. Black

Intervala, LLC

Garry D. McGuire

NASA Marshall Space Flight
Center

* Leader of the A-Team at the time this document was published.

For a complete list of acknowledgments:
www.electronics.org/acknowledgements-page

This Page Intentionally Left Blank

Table of Contents

1.0	GENERAL	1-1	1.19	Handling, Preservation and Packaging	1-9
1.1	Scope	1-1	2.0	APPLICABLE DOCUMENTS	2-1
1.2	Purpose	1-1	2.1	IPC	2-1
1.3	Classification	1-1	2.2	American Society of Mechanical Engineers	2-1
1.4	Measurement Units and Applications	1-1	2.3	EIA	2-1
1.4.1	Verification of Dimensions	1-1	2.4	Electrostatic Discharge Association	2-1
1.4.2	Relationship of AWG and Wire Size.....	1-1	2.5	International Organization for Standardization .	2-2
1.5	Definition of Requirements	1-1	2.6	International Electrotechnical Commission	2-2
1.5.1	Inspection Conditions.....	1-2	2.7	Automotive Industry Action Group	2-2
1.5.1.1	Acceptable	1-2	2.8	American Welding Society	2-2
1.5.1.2	Defect.....	1-2	2.9	ASTM	2-3
1.5.1.2.1	Disposition	1-2	2.10	GEIA	2-3
1.5.1.3	Process Indicator	1-2	2.11	Aerospace Industry Association	2-3
1.5.1.4	Conditions Not Specified.....	1-2	2.12	International Aerospace Quality Group	2-3
1.5.1.5	Uncommon or Specialized Designs.....	1-3	2.13	Society of Automotive Engineers (SAE)	2-3
1.5.2	Material and Process Nonconformance	1-3	3.0	GENERAL REQUIREMENTS	3-1
1.6	Process Control Requirements	1-3	3.1	Wire Preparation	3-1
1.6.1	Statistical Process Control (SPC).....	1-3	3.2	Soldering	3-1
1.7	Order of Precedence	1-4	3.3	Crimping	3-1
1.8	Terms and Definitions	1-4	3.4	Splices	3-1
1.8.1	Clause References	1-4	3.5	Fiber Optic Cables	3-1
1.8.2	Appendices.....	1-4	3.6	Coaxial Cables	3-1
1.9	Requirements Flowdown	1-4	3.7	General Damage	3-1
1.10	Personnel Proficiency	1-4	4.0	ENCLOSURE FABRICATION	4-1
1.11	Acceptance Requirements	1-4	4.1	Surface Types	4-1
1.12	Inspection	1-4	4.2	Inspection	4-1
1.12.1	Sampling.....	1-4	4.3	Sheet Metal Processing	4-1
1.12.2	Lighting	1-4	4.3.1	Sheet Metal Minimum Bend Radius.....	4-2
1.12.3	Magnification Aids	1-5	4.4	Casting Surface	4-3
1.13	Facilities	1-5	4.5	Welding and Brazing Specifications	4-4
1.13.1	Field Assembly Operations.....	1-5	4.5.1	Procedure Qualification	4-4
1.14	Electrostatic Discharge (ESD) Control Program .	1-6	4.5.2	Personnel Qualification	4-4
1.14.1	ESD Packaging.....	1-6	4.6	Helical-Coil Inserts	4-4
1.15	Tools and Equipment	1-6	4.7	Rivets	4-5
1.15.1	Control	1-6	4.7.1	Material Preparation	4-5
1.15.2	Calibration	1-6	4.7.2	Conventional Rivets	4-6
1.16	Materials and Processes	1-7	4.7.2.1	Driven/Shop Formed Head.....	4-6
1.17	Electrical Clearance	1-7	4.7.2.1.1	Dimples	4-6
1.18	Foreign Object Debris (FOD)	1-9			

Table of Contents (cont.)

4.7.2.1.2	Diameter and Height	4-6	6.4.3	Application of Materials	6-2
4.7.2.1.3	Malformed Rivets	4-7	6.4.4	Acceptance Criteria for Encapsulants	6-3
4.7.2.1.4	Concentricity	4-7	6.4.5	Acceptance Criteria for Sealants	6-6
4.7.2.1.5	Cracks	4-8	6.5	Application of Thermal Compounds and Pads ..	6-7
4.7.2.2	Manufactured Head	4-9	6.5.1	Surface Preparation	6-7
4.7.2.2.1	Marred Heads	4-9	6.5.2	Masking	6-7
4.7.2.2.2	Flattened Heads	4-9	6.5.3	Application of Thermal Compound	6-8
4.7.2.2.3	Open Heads (Gapping)	4-10	6.5.4	Thermal Compound Application Process Development Guidelines	6-9
4.7.2.2.4	Flush Rivet Head Height	4-10	6.5.5	Application of Thermal Pads	6-11
4.7.3	Blind Rivets	4-11	6.5.6	Workmanship – Thermal Compound	6-11
4.7.3.1	Open Heads (Gapping)	4-11	6.5.6.1	Prior to Mating Surfaces	6-12
4.7.3.2	Flush Rivets	4-11	6.5.6.2	After Component Surfaces Have Been Mated ..	6-13
4.7.3.3	Hollow Type Rivets	4-12	6.5.7	Thermal Pads	6-14
4.7.4	Sheet and Hole Requirements	4-13	7.0	INSTALLATION	7-1
4.7.4.1	Sheet Deformation	4-13	7.1	Installation of Heat Exchangers and Piping	7-1
4.7.4.2	Countersinks	4-14	7.1.1	Heat Exchangers	7-1
4.7.4.3	Misalignment	4-14	7.1.2	Piping	7-1
4.7.5	Specialized Rivets	4-14	7.2	Installation of Flexible and Rigid-Flex Printed Board Assemblies	7-2
5.0	SURFACE FINISHES	5-1	7.3	Installation of Printed Board Assemblies	7-4
5.1	Application	5-1	7.4	Connector Installation	7-5
5.2	Curing and Adhesion	5-1	7.5	Threaded Fastener Installation	7-5
5.3	Performance Requirements	5-1	7.5.1	Process	7-6
5.4	Inspection	5-1	7.5.1.1	Torque	7-7
5.4.1	Appearance	5-1	7.5.1.1.1	Sequence/Torque Pattern	7-7
5.4.2	Color and Gloss	5-2	7.5.2	Tooling and Equipment	7-8
5.4.2.1	Spectrophotometric Analysis	5-2	7.5.3	Materials Applied to the Fastener System	7-8
5.4.2.2	Visual	5-2	7.6	Hardware Installation	7-9
5.4.3	Cosmetic Flaws	5-2	7.7	Electrical Bonding	7-11
5.4.4	Inorganic Coating Inspection	5-3	7.8	Installation of Heatsinks	7-11
5.4.5	Organic Coating Inspection	5-3	7.8.1	Heatsink Hardware	7-11
5.4.5.1	Complex Shapes	5-4	8.0	CABLE/HARNESS INSTALLATION	8-1
5.5	Touch-Up of Surface Finish	5-6	8.1	General	8-1
6.0	APPLICATION OF NON-METALLIC MATERIALS FOR ASSEMBLY	6-1	8.2	Cable/Wire Harness Protective Coverings	8-2
6.1	Cleaning	6-1	8.2.1	Braid – Prewoven	8-2
6.2	Foamed Polymers	6-1	8.2.2	Sleeving/Shrink Tubing	8-4
6.3	Adhesive Bonding	6-1	8.2.2.1	Sealant	8-5
6.4	Encapsulants and Sealants	6-1	8.2.3	Spiral Plastic Wrap (Spiral Wrap Sleeving)	8-6
6.4.1	Surface Preparation	6-2	8.2.4	Split and Unsplit Wire Loom Tubing	8-7
6.4.2	Material Preparation	6-2			

Table of Contents (cont.)

8.2.5	Adhesive or Non-Adhesive Barrier and Conductive Tapes	8-7	8.12.1	Bending	8-42
8.2.6	Sleeving and Boots	8-8	8.12.2	Attachment	8-42
8.2.6.1	Position	8-8	8.13 Shield Termination	8-43	
8.2.6.2	Bonding	8-9	8.13.1	Shield Jumper Wire	8-43
8.3 Securing	8-11	8.13.1.1	Attached Lead – Solder	8-43	
8.3.1	Tie Wrap/Lacing Application	8-11	8.13.1.2	Attached Lead – Crimp	8-47
8.3.1.1	Tightness	8-16	8.13.1.3	Shield Braid – Woven	8-48
8.3.1.2	Damage	8-17	8.13.1.4	Shield Braid – Combed and Twisted	8-48
8.3.1.3	Spacing	8-17	8.13.2	Unterminated Shield	8-49
8.3.2	Breakouts	8-18	8.13.2.1	Shield Not Folded Back	8-50
8.3.2.1	Individual Wires	8-18	8.13.2.2	Shield Folded Back	8-50
8.3.2.2	Spacing	8-19	8.13.3	Connector	8-51
8.3.3	Routing	8-21	8.13.3.1	Shrink	8-51
8.3.3.1	Wire Crossover	8-21	8.13.3.2	Crimp	8-52
8.3.3.2	Bend Radius	8-22	8.13.3.3	Shield Jumper Wire Attachment	8-54
8.3.3.3	Coaxial Cable	8-24	8.13.3.4	Soldered	8-55
8.3.3.4	Unused Wire Termination	8-25	8.14 Conduit (Shielding)	8-56	
8.3.3.4.1	Shrink Sleeving	8-25	8.15 Shrink Tubing – Conductive Lined	8-56	
8.3.3.4.2	Flexible Sleeving	8-26	9.0 CONNECTORIZATION	9-1	
8.3.3.5	Ties Over Splices and Ferrules	8-27	9.1 Hardware Mounting	9-1	
8.3.4	Broom Stitching	8-28	9.1.1	Jackpost – Height	9-1
8.3.5	Intersecting Wire Bundles/Cables	8-28	9.1.2	Jackscrews – Protrusion	9-2
8.4 Hardware Installation – Threaded Fasteners ..	8-28	9.1.3	Retaining Clips	9-3	
8.4.1	Wires	8-29	9.1.4	Connector Alignment	9-4
8.4.1.1	Solid Wires	8-29	9.2 Strain Relief	9-5	
8.4.1.2	Stranded Wires	8-31	9.2.1	Clamp Fit	9-5
8.4.2	Safety Wiring	8-32	9.2.2	Wire Dress	9-7
8.4.3	Safety Cable	8-34	9.2.2.1	Straight Approach	9-7
8.5 Stress Relief	8-34	9.2.2.2	Side Approach	9-8	
8.6 Wire Dress	8-35	9.3 Connector Damage	9-9		
8.7 Service Loops	8-36	9.3.1	Criteria	9-9	
8.8 Clamping	8-37	9.3.2	Limits – Hard Face Mating Surface	9-10	
8.9 Shield Termination – Splicing Prewoven	8-37	9.3.3	Limits – Soft Face Mating Surface or Rear Seal Area	9-11	
8.9.1	Soldered	8-38	9.3.4	Contacts	9-12
8.10 Raceways	8-39	9.4 Installation of Contacts and Sealing Plugs into Connectors	9-13		
8.11 Grommets	8-40	9.4.1	Installation of Contacts	9-13	
8.11.1	Wire/Cable/Bundle – Sealing Not Required	8-40	9.4.2	Installation of Sealing Plugs	9-15
8.11.2	Wire/Cable/Bundle – Sealing Required	8-41	9.5 Center Pin	9-16	
8.12 Terminal Lugs	8-42				

Table of Contents (cont.)

9.5.1	Position	9-16	Table 4-1	Inspection Criteria for Metal Processing.....	4-1
9.5.2	Damage	9-17	Table 4-2	Minimum Bend Radius Requirements for Aluminum Alloys	4-2
9.6	Mechanical Test Methods – Contact Retention Verification	9-17	Table 4-3	Minimum Bend Radius Requirements for 300 Series Stainless Steel.....	4-2
10.0	MARKING/LABELING	10-1	Table 4-4	Welding and Brazing Reference Documents ...	4-4
10.1	Marking Requirements.....	10-1	Table 4-5	Identification Markings on Conventional/ Solid Rivets	4-5
10.1.1	General.....	10-1	Table 4-6	Dimensions of Driven/Shop Formed Head (mm [in]).....	4-6
10.1.2	Surface Preparation	10-1	Table 4-7	A-Max Dimension by Rivet Size.....	4-11
10.1.3	Location.....	10-2	Table 5-1	Inspection Criteria for Inorganic Coatings.....	5-3
10.1.4	Curing and Adhesion	10-2	Table 5-2	Inspection Criteria for Organic Coatings	5-3
10.1.5	Content, Legibility and Permanency.....	10-2	Table 7-1	Minimum Bend Ratio for Flexible Printed Board Assemblies	7-2
10.2	Internal Assemblies and Subassemblies.....	10-2	Table 8-1	Minimum Bend Radius Requirements.....	8-22
11.0	TESTING/VERIFICATION	11-1	Table 8-2	Bend Radius Requirements for Harness Assemblies with Optical Fiber or Optical Cable	8-23
APPENDIX A	Terms and Definitions.....	A-1	Table 8-3	Minimum Swaged Ferrule Pull-Off Load.....	8-34
Tables					
Table 1-1	Magnification Aids – Wire Applications	1-5			
Table 1-2	Magnification Aids – Other Applications	1-5			